

Accelerating Innovation Research (AIR)

PROGRAM SOLICITATION

NSF 10-608



National Science Foundation

Directorate for Engineering
Industrial Innovation and Partnerships

Letter of Intent Due Date(s) (required) (due by 5 p.m. proposer's local time):

December 01, 2010

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

February 01, 2011

IMPORTANT INFORMATION AND REVISION NOTES

A revised version of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), [NSF 11-1](#), was issued on October 1, 2010 and is effective for proposals submitted, or due, on or after January 18, 2011. Please be advised that the guidelines contained in [NSF 11-1](#) apply to proposals submitted in response to this funding opportunity. Proposers who opt to submit prior to January 18, 2011, must also follow the guidelines contained in [NSF 11-1](#).

Cost Sharing: The PAPPG has been revised to implement the National Science Board's recommendations regarding cost sharing. Inclusion of voluntary committed cost sharing is prohibited. In order to assess the scope of the project, all organizational resources necessary for the project must be described in the Facilities, Equipment and Other Resources section of the proposal. The description should be narrative in nature and must not include any quantifiable financial information. Mandatory cost sharing will only be required when explicitly authorized by the NSF Director. See the PAPP Guide Part I: *Grant Proposal Guide (GPG)* Chapter II.C.2.g(xi) for further information about the implementation of these recommendations.

Data Management Plan: The PAPPG contains a clarification of NSF's long standing data policy. All proposals must describe plans for data management and sharing of the products of research, or assert the absence of the need for such plans. FastLane will not permit submission of a proposal that is missing a Data Management Plan. The Data Management Plan will be reviewed as part of the intellectual merit or broader impacts of the proposal, or both, as appropriate. Links to data management requirements and plans relevant to specific Directorates, Offices, Divisions, Programs, or other NSF units are available on the NSF website at: <http://www.nsf.gov/bfa/dias/policy/dmp.jsp>. See Chapter II.C.2.j of the GPG for further information about the implementation of this requirement.

Postdoctoral Researcher Mentoring Plan: As a reminder, each proposal that requests funding to support postdoctoral researchers must include, as a supplementary document, a description of the mentoring activities that will be provided for such individuals. Please be advised that if required, FastLane will not permit submission of a proposal that is missing a Postdoctoral Researcher Mentoring Plan. See Chapter II.C.2.j of the GPG for further information about the implementation of this requirement.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Accelerating Innovation Research (AIR)

Synopsis of Program:

To accelerate the process of innovation, NSF is undertaking two related, new activities. The first will encourage the translation of the numerous, technologically-promising, fundamental discoveries made by NSF researchers, while drawing upon and building the entrepreneurial spirit of the researchers and students. The second activity will foster connections between an existing NSF innovation research alliance (including consortia such as Engineering Research Centers (ERC), Industry University Cooperative Research Centers (I/UCRC), Partnerships for Innovation (PFI), Science and Technology Centers (STC), Nanoscale Science and Engineering Centers (NSEC), Materials Research Science and Engineering Centers (MRSEC) grantees) and other institutions, whose complementary focus will spur the development of discoveries into innovative technologies through collaboration. Both of these activities are designed to strengthen the U.S. innovation ecosystem.

WEBINAR: A webinar will be held in September 2010 to answer any questions about this solicitation. Details will be posted on the Industrial Innovation and Partnerships (IIP) website (<http://www.nsf.gov/div/index.jsp?div=iip>) as they become available.

Cognizant Program Officer(s):

- Rathindra DasGupta, Program Director, telephone: (703) 292-8353, email: rdasgupt@nsf.gov

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

Award Information

Anticipated Type of Award: Continuing Grant

Estimated Number of Awards: 18 Option 1: Technology Translation Plan Competition: The budget for this competition is \$350,000 for up to two years per award, including a supplement of up to \$50,000; approximately 10 awards. Option 2: Research Alliance Competition: The budget for this option is \$1,000,000 for up to two years; approximately 8 awards.

Anticipated Funding Amount: \$12,000,000 pending availability of funds

Eligibility Information

Organization Limit:

None Specified

PI Limit:

PI may submit to Option 1 or Option 2, but NOT both. PI must specify to which option he or she is submitting.

There may be only one co-PI for Option 1, and one co-PI for Option 2.

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI: 1

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposals:**
 - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at:
http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg.
 - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at:
http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)

B. Budgetary Information

- **Cost Sharing Requirements:** Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:** Not Applicable
- **Other Budgetary Limitations:** Not Applicable

C. Due Dates

- **Letter of Intent Due Date(s) (*required*)** (due by 5 p.m. proposer's local time):
December 01, 2010
- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):
February 01, 2011

Proposal Review Information Criteria

Merit Review Criteria: National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

Award Administration Information

Award Conditions: Standard NSF award conditions apply.

Reporting Requirements: Additional reporting requirements apply. Please see the full text of this solicitation for further information.

TABLE OF CONTENTS

Summary of Program Requirements

- I. **Introduction**
- II. **Program Description**
- III. **Award Information**
- IV. **Eligibility Information**
- V. **Proposal Preparation and Submission Instructions**
 - A. [Proposal Preparation Instructions](#)
 - B. [Budgetary Information](#)
 - C. [Due Dates](#)
 - D. [FastLane/Grants.gov Requirements](#)
- VI. **NSF Proposal Processing and Review Procedures**
 - A. [NSF Merit Review Criteria](#)
 - B. [Review and Selection Process](#)
- VII. **Award Administration Information**
 - A. [Notification of the Award](#)
 - B. [Award Conditions](#)
 - C. [Reporting Requirements](#)
- VIII. **Agency Contacts**
- IX. **Other Information**

I. INTRODUCTION

America's prosperity has originated in part from the ability to capitalize economically on ground-breaking discoveries from science and engineering research. Simultaneously, a knowledgeable, creative workforce has maintained the country's global leadership in crucial areas of technology. These important discoveries and capable workforce resulted from substantial, sustained investment in science and engineering. A strong capacity for translating fundamental scientific discoveries into powerful engines of innovation is essential to maintain our competitive edge in the future.

The National Science Foundation (NSF) supports both fundamental research and education in science and engineering. NSF's dual role, unique among government agencies, results in new knowledge and tools as well as a capable, innovative workforce. These complementary building blocks of innovation have led to revolutionary technological advances and wholly new industries.

Through this initiative NSF seeks to accelerate the translation of new knowledge from fundamental research into novel products that provide new value. NSF investment will strategically strengthen the innovation ecosystem (<http://www.nsf.gov/eng/iip/innovation.pdf>) by addressing the early stage of the innovation process. This solicitation will support research and collaborations that will help overcome obstacles in the path of innovation.

II. PROGRAM DESCRIPTION

The Directorate for Engineering (ENG) of the National Science Foundation (NSF) invites requests for funding under the Accelerating Innovation Research solicitation. The goals of this program are to spur translation of fundamental research, to encourage collaboration between academia and industry, and to train students who understand innovation and entrepreneurship.

The two options available for requesting funding from NSF are described below:

A. **Technology Translation Plan Competition (Option 1)**

The Technology Translation Plan Competition is designed to support innovative ideas in the translation of fundamental science and engineering discoveries into commercial reality. Outcomes of this competition will be more discoveries on the path to becoming new technologies, and the engagement of faculty and students in entrepreneurial/innovative thinking.

This solicitation provides an opportunity for investigators to complete the necessary research (such as prototyping and/or scale-up of production) and prepare a Technology Translation Plan for their new product or process concept. The NSF award will require an individual investigator to generate a plan for bringing to market a concept for which the basic research has previously been accomplished. Proposals will include a Preliminary Technology Translation Plan (PTTP). The plans will be reviewed by a panel of academic and business experts and awards will be made based on merit and the acceptable achievement of defined milestones (described in detail in a later section).

Awardees will later deliver a Final Technology Translation Plan (FTTP) that includes a technology demonstration suitable to attract subsequent funding for further development and commercialization.

The Technology Translation Plan Competition is intended to help bridge the funding gap between research that validates relevant science and engineering fundamentals and the commercialization of a new technology.

The maximum award size for the PTTP Competition is \$300,000 for up to 2 years per award, commensurate with the planned activities. Third party investment (1:1) is required for budget requests in excess of \$150,000.

The maximum award size for the FTTP, submitted as a supplement to the original award, is \$50,000.

B. **Research Alliance Competition (Option 2)**

The Research Alliance competition is intended to foster a collaborative effort between an NSF-funded innovation research alliance (including consortia such as ERC, IUCRC, PFI, STC, NSEC, MRSEC grantees) and at least one partner entity to form a **synergistic relationship** that will accelerate the innovation of a product, a process or system. The ideal partnership would be one that ultimately leverages the collaborative relationship developed

under the grant to strengthen the innovation ecosystem. The collaboration would link multiple entities such that research results are more rapidly moved into marketable products through the creation of new start-up businesses or partnerships with existing businesses. The grant may be used to fund translational research necessary to bring a particular technology from either the research alliance or the partner entity to market, or to fund infrastructure, such as a rapid prototype facility, that would enable technologies to be more rapidly commercialized. An Option 2 award will enable 1) faster translation of research and/or technology (ies) into new start up business (es) or existing firms; 2) development of a network of connections between university researchers and others leading to an innovation ecosystem; 3) creation of jobs as a result of the innovation ecosystem; and 4) the preparation of students who understand innovation and entrepreneurship.

The award will be up to \$1,000,000 per grant, for up to 2 years duration commensurate with the planned activities. Third party investment (1:1) is required.

C. Third Party Investment:

In order for innovation research to be successful, it is essential that a third party investment is in place as a means to accelerate the innovation toward commercialization of a product, process, or service. The partnership between the NSF-funded academic entity and the third party investor will create an academic entity based innovation ecosystem that offers a cost-effective, timely, and risk-reduced approach for potential investors to participate in the development of new technologies, products, and services having potentially high commercial impact. Market research, advertising, patent applications, and refining of the business plan are good examples of uses of the third party investment.

A third-party investor may include such entities as another company, a venture capital firm, an individual "angel" investor, federal (non-SBIR), state or local government, or any combinations of the above. The third party investments must be directly tied to the research project envisioned by the application.

The third party investment can be cash, liquid assets, or tangible financial instruments. Intangible assets (e.g. "in-kind") are also acceptable.

III. AWARD INFORMATION

Anticipated Type of Award: Continuing Grant

Estimated Number of Awards: 18 Option 1: Technology Translation Plan Competition: The budget for this competition is \$350,000 for up to two years per award, including a supplement of up to \$50,000; approximately 10 awards. Option 2: Research Alliance Competition: The budget for this option is \$1,000,000 for up to two years; approximately 8 awards.

Anticipated Funding Amount: \$12,000,000

Estimated program budget, number of awards, and average award size/duration are subject to the availability of funds.

IV. ELIGIBILITY INFORMATION

Organization Limit:

None Specified

PI Limit:

PI may submit to Option 1 or Option 2, but NOT both. PI must specify to which option he or she is submitting.

There may be only one co-PI for Option 1, and one co-PI for Option 2.

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI: 1

Additional Eligibility Info:

Option 1: Technology Translation Competition

The Principal Investigator or a co-PI must be a current or prior NSF awardee and a faculty member at a US college or university at the time of award in the current competition.

Subject technology must be derived from a discovery research project already conducted or initiated by the National Science Foundation.

Option 2: Research Alliance Competition

One of the partners must be an NSF funded innovation research alliance (including Centers for Analysis and Synthesis, Centers for Chemical Innovation, Engineering Research Centers, Industry/University Collaborative Research Centers, Materials Research Science and Engineering Centers, Nanoscale Science and Engineering Centers, Science and Technology Centers, and Science of Learning Centers). The research alliance must be active at the time of award in the current competition.

The other partner(s) may be another research entity (either NSF-funded, other government agency funded, or privately funded), a small business consortium, or a local or regional innovation entity. There must be at least two partners.

The submitting institution must be the NSF funded research alliance. The partners will either be sub-contracted to the NSF research alliance or will bring their own funding to the partnership. For example, if a partner entity is a federally funded National Laboratory or FFRDC (Federally Funded Research and Development Center), that center or agency must co-fund its portion of the effort because, in general, NSF funds cannot be used to support other federally funded centers.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent(required):

Submission of a Letter of Intent (LOI) from the lead institution is mandatory. Letters of intent are to be submitted via FastLane which is available at <http://fastlane.nsf.gov/>. The LOI allows NSF to examine the proposals with respect to the eligibility requirements, to identify correctable issues, and to categorize proposals in order to prepare for the proposal review process.

Enter the requested core Letter of Intent information as prompted by FastLane. Additionally, complete these data fields for the LOI:

- Brief description of Scope of Work
- A compelling argument to support acceleration of innovation
- Option 1: Provide identification of the third party investor(s)
- Option 2: Provide identification of the research party(ies) and the third party investor(s)

Note that LOIs are restricted as to fields and number of characters that can be entered in FastLane.

Letter of Intent Preparation Instructions:

When submitting a Letter of Intent through FastLane in response to this Program Solicitation please note the conditions outlined below:

- Sponsored Projects Office (SPO) Submission is required when submitting Letters of Intent
- Submission of multiple Letters of Intent is not allowed

Full Proposal Preparation Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

Guide to Submission of a Preliminary Technology Translation Plan (Option 1)

For specific information related to Option 1, please contact Mary Toney, Program Director, email: mtoney@nsf.gov, and copy Rathindra DasGupta, Program Director, rdasgupt@nsf.gov.

Note: the submission criteria outlined below are in addition to requirements contained within the NSF Grant Proposal Guide (GPG) or NSF Grants.gov Application Guide.

A Preliminary Technology Translation Plan (PTTP) proposal consists of the following parts:

A. Cover Sheet:

The cover sheet is automatically generated by FastLane or Grants.gov based on information entered into the "Cover Sheet" module.

B. Project Summary:

The summary MUST have the following components:

1. A summary limited to 200 words addressing the Intellectual Merits of the proposed activity. No proprietary information should be included in the summary.
2. A summary limited to 200 words addressing the Broader Impacts of the proposed activity. Include information on how the innovation will enhance scientific and technological understanding. Describe the potential societal and commercial impact of the project.
3. A listing of "key" words. The key words/phrases should identify the areas of technical expertise in science, engineering, or education which are to be invoked in reviewing the proposal; and the areas of application that are the initial target of the technology.

C. Table of Contents:

The table of contents is automatically generated by FastLane or Grants.gov.

D. Project Description:

Cannot exceed 15 pages, and must include the following:

- A detailed description of the technology developed, a listing of funding sources, amount and timing of

such funding, and its contribution to the maturation of the proposed technology to its current state. In review, preference will be given to those technologies that have the most compelling combination of market potential and closeness to commercialization.

- A succinct specification of the current state of the technology and the remaining research needed for the successful translation of the subject technology to commercial development. This section should specify the technological knowledge gaps that need to be filled and the research methods to be used to fill them.
- A justification that the technology is capable of delivery as a fully functioning prototype with an additional year of research and a plan for how that will be accomplished.
- A preliminary market research study to support the commercial potential of the proposed technology development. This section should include a detailed discussion of the market need addressed, competitive technologies for meeting the need and their shortcomings, and how the subject technology will provide a solution with compelling profit potential. If it is proposed that intellectual property will be held as trade secrets, a compelling argument must be presented for this choice.
- A preliminary patent search and accompanying discussion to support the feasibility of obtaining needed licenses and/or sufficient protection for intellectual property developed. This section should include a discussion of any relevant background intellectual property held by the proposing institution, its availability for licensing, and an assessment of how another party might patent or practice around both background and anticipated intellectual property assets.
- Detailed discussion of plans to employ business consulting and advisory services available from management schools, established entrepreneurs, Angel Investor groups, local or state governments, business plan competitions, and/or venture capital forums.
- A detailed plan for involvement of undergraduate, graduate students and post-docs, incorporating an explanation of how the proposed effort will enhance the knowledge of innovation.

E. *References Cited*

Provide a comprehensive listing of relevant reference sources, including patent citations.

F. *Biographical sketches*

Short bios of the PTPP team members (two pages maximum per team member), highlighting their technical expertise and track records in successful technology and business development. Exhaustive academic resumes are not appropriate.

G. *Proposal Budget*

The NSF Summary Proposal Budget is generated in FastLane or Grants.gov. Prepare a budget for each year. The system will automatically generate a cumulative budget for the entire project.

Note that the maximum funding for the Preliminary Technology Translation Plan (PTTP) Competition is \$300,000 for up to two years, per grant; and a possible supplemental funding of up to \$50,000, per award, for the Final Technology Translation Plan (FTTP). Successful FTTPs will be included in the "Technology Showcase," as discussed later.

Funding requests will be evaluated relative to the scope and balance of the research planned. For example, if the proposal is a funding request for expenses associated with a proof-of-concept (POC), prototype development and submission of a commercialization plan, the maximum award is \$300,000. For budget requests in excess of \$150,000, third party investment (1:1) is required with less than 25 percent of the third party investment being in-kind and the rest in cash.

A proof of concept (POC) is realization of a certain method or idea to ascertain its scientific or technological parameters. A POC should be sufficiently understood so that potential application areas can be identified and a working prototype designed.

A prototype is a functional demonstration of the POC that addresses a relevant application. The prototype should be understood well enough to identify performance parameters, design criteria and functional limitations in an application area. At this stage, predictions of possible manufacturing techniques, costs and scalability can be made into commercial products.

If a POC has previously been developed, and a prototype and submission of a commercialization plan are all that remains for the research activity, the maximum award considered would be \$200,000. For budget requests in excess of \$150,000, third party investment (1:1) is required with less than 25 percent of the third party investment being in-kind and the rest in cash.

If the proposal is a funding request for only expenses associated with generating a Final Technology Translation Plan (i.e. no research), the proposal will not be accepted. This opportunity is to allow for "finishing" the research and preparing for commercialization.

It is allowable to expend up to 50 percent of the total budget as a subcontract to a small business, as defined by the Small Business Administration. NSF does not intend to fund industrial research and development; therefore, the proposed subcontract should augment the research capabilities of the proposing academic institution. The university/industry collaboration should be explained and justified in the Preliminary Technology Translation Plan and budget description.

Budget justification for the proposed budget must indicate how and where the requested funds will be spent. Note that costs of patents, marketing studies, and prototype development are allowable costs. Investigators must also include in their budget the cost for travel to NSF for presentation of their Final Technology Translation Plan (details to be provided after award).

H. *Current and Pending Support*

The proposal should provide information regarding all research to which the Principal Investigator (PI) and other senior personnel either have committed time or have planned to commit time. If none, state NONE.

For all ongoing or proposed projects, except Equivalent and Overlapping Proposals to Other Federal Agencies, the following information should be provided for the Principal Investigator and senior personnel:

- Name of sponsoring organization;
 - Title and performance period of the proposal; and
 - Person-months/calendar months (per year) devoted to the project by the Principal Investigator and each of the senior personnel.
- **Current and Pending Support must be uploaded into the system. The proposal being submitted is considered "pending" and therefore MUST appear in the Current and Pending Support module.**

I. *Facilities, Equipment, and Other Resources*

Discuss requirements for and the availability of equipment, instrumentation, and facilities required for the proposed

project.

J. Supplementary Documents

The supplementary documents section consists of the following components, as applicable.

Proposals missing any of these documents will be returned without review.

- Milestone Chart with specific tasks and deliverables.
- Letters of commitment from the expected third party investors.
- A Data Management Plan, or an assertion of the absence of the need for such a plan.
- If applicable, a one-page statement describing mentoring activities provided to postdoctoral researchers supported on the project.
- Finance and Revenue Model (preliminary): enumerate the level of funding required for each stage along the path to commercialization.

Expected accomplishments of the initial funding period:

A Final Technology Translation Plan, suitable for review by potential third-party investors, must be submitted to NSF within 18 months of the start date of the initial award. Final Technology Translation Plans submitted after the 18-month deadline will be returned without review. Intellectual property (IP) protection, including patent disclosures and filings, should have been obtained in preparation for disclosure of the Final Technology Translation Plan to potential third-party funders at the Technology Showcase.

The Final Technology Translation Plan (FTTP) must include an overview of the technical and commercial opportunity, a strategy for development, and a plan for translating the concept from early stage prototype development to commercialization.

The Final Technology Translation Plan (FTTP) must also include a discussion of the status and potential (if relevant) for each of the following topic areas:

- Technical - results of proof-of-concept and prototype development, evaluation, design issues, development strategy.
- Legal - Availability, strength and defensibility of background and anticipated IP protection, and current status of patent disclosures, filings, licensing opportunities, and environmental health and safety, liability, and regulatory issues.
- Manufacturing - discussion of potential processes, estimated capital investment required at commercial scale, and projected unit costs.
- Marketing - competitive technologies, product launch plan.
- Financial - required funds, estimated revenues, capital expenditures, and payback period.
- Human Resources - key personnel, including short bios.

Final Technology Translation Plan awardees (those selected to receive the supplemental funding) are expected to attend and participate in a "Technology Showcase" (details to be provided after award) to be held approximately 21 months after the start date of the initial award. At the showcase, each project team will pitch their Technology Translation Plans to potential funders.

Guide to Submission of a Research Alliance Competition Proposal (Option 2)

For specific information related to Option 2, please contact Barbara Kenny, Program Director, email: bkenny@nsf.gov or Deborah Jackson, Program Director, email: djackson@nsf.gov, and copy Rathindra DasGupta, Program Director, rdasgupt@nsf.gov.

Note: the submission criteria outlined below are in addition to requirements contained within the NSF Grant Proposal Guide (GPG) or NSF Grants.gov Application Guide.

The Research Alliance Competition Proposal consists of the following parts:

A. Cover Sheet:

The cover sheet is automatically generated by FastLane or Grants.gov based on information entered into the "Cover Sheet" module.

B. Project Summary:

The summary MUST have the following components:

1. A summary limited to 200 words addressing the Intellectual Merits of the proposed activity. No proprietary information should be included in the summary.
2. A summary limited to 200 words addressing the Broader Impacts of the proposed activity. Describe the potential societal and commercial impact of the project.
3. A listing of "key" words. The key words/phrases should identify the areas of technical expertise in science, engineering, or education which are to be invoked in reviewing the proposal.

C. Table of Contents:

The table of contents is automatically generated by FastLane or Grants.gov.

D. Project Description:

Cannot exceed 15 pages, and must include the following:

- How the partnership will enable innovation that neither party could do as well or rapidly alone.
- How the partnership leverages the research and technology of the research alliance to accelerate innovation.
- How the partnership is expected to impact the development of an innovation ecosystem.
- A strategic plan and milestone chart with specific tasks and deliverables.
- Information on management and staffing.
- An assessment plan that will gauge the success of the partnership in creating an innovation ecosystem that includes the development of and justification for appropriate metrics. Proposers participating in the OSTP/NSF/NIH Federal Demonstration Partnership's STAR METRICS program, (http://sites.nationalacademics.org/PGA/fdp/PGA_057189) are encouraged to contact their institutional representatives to identify ways in which the program could support this requirement.
- An education plan that shows how participating students will learn about innovation, entrepreneurship, and technology translation process.

E. References Cited

Provide a comprehensive listing of relevant reference sources, including patent citations.

F. Biographical sketches

Short bios (two pages maximum per team member) of the team members, highlighting their technical expertise and track records in successful technology and business development. Exhaustive academic resumes are not appropriate.

G. Proposal Budget

The NSF Summary Proposal Budget is generated in FastLane or Grants.gov. Prepare a budget for each year. The system will automatically generate a cumulative budget for the entire project. The budget must include funds for a one day trip to NSF in Arlington, VA at the end of the first year.

The award will be up to \$1,000,000 for 2 years, per grant, pending the achievement of intermediate milestones as specified in the strategic plan and reported in the annual report. Committed third party funding (1:1) is required at the time of proposal submission. Up to 25 percent of the third party investment may be in-kind, and the rest must be in cash. The selected proposal will receive up to \$500,000 for the first year. The remainder will be provided once the following conditions are met:

- The proposed one year milestones are achieved, as documented in the first year's annual report.
- As part of the first year's annual reporting requirements, the PI also provides an updated strategic plan, approved by the NSF Program Director, to meet the remaining milestones over the last year of the grant.
- There is committed third party investment in place.
- The PI of the NSF-funded Center, a representative from the partner entity, and a representative of a third party investor present the first year's accomplishments and plans for the second year. The presentation will be held at NSF and details will be provided after award.

H. Current and Pending Support

The proposal should provide information regarding all research to which the Principal Investigator (PI) and other senior personnel either have committed time or have planned to commit time. If none, state NONE.

For all ongoing or proposed projects, except Equivalent and Overlapping Proposals to Other Federal Agencies, the following information should be provided for the Principal Investigator and senior personnel:

- Name of sponsoring organization;
- Title and performance period of the proposal; and
- Person-months/calendar months (per year) devoted to the project by the Principal Investigator and each of the senior personnel.
- **Current and Pending Support must be uploaded into the system. The proposal being submitted is considered "pending" and therefore MUST appear in the Current and Pending Support module.**

I. Facilities, Equipment, and Other Resources

Discuss requirements for and the availability of equipment, instrumentation, and facilities required for the proposed work.

J. Supplementary Documents

The supplementary documents section consists of the following components, as applicable.

Proposals missing any of these documents will be returned without review.

- Letters of commitment from the expected third party investors.
- A table of third party investments that shows the source, the amount, and the type (in-kind such as personal or equipment, or cash).
- A Data Management Plan, or an assertion of the absence of the need for such a plan.
- If applicable, a one-page statement describing mentoring activities provided to postdoctoral researchers supported on the project.
- A table that shows how NSF and non-NSF funding will be allocated functionally across proposed tasks for each year.

Expected accomplishments of the grant:

1. The proposed work will enable the translation of research results and/or technologies into new start-up businesses or existing firms.
2. The proposed work will result in the development of a network of connections between university researchers and the business community that accelerates innovation.
3. At the end of the proposed work, there will be measurable evidence, as documented using the proposed assessment method(s) and metric(s), of a developing innovation ecosystem and the creation of jobs through the execution of the award's strategic plan.
4. The proposed work will result in students who are prepared to be entrepreneurially competitive.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

C. Due Dates

- **Letter of Intent Due Date(s) (required)** (due by 5 p.m. proposer's local time):

December 01, 2010

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):

February 01, 2011

Do not submit a proposal prior to January 1, 2011

D. FastLane/Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

Detailed technical instructions regarding the technical aspects of preparation and submission via FastLane are available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane Website at: <https://www.fastlane.nsf.gov/fastlane.jsp>.

- **For Proposals Submitted Via Grants.gov:**

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. The Grants.gov's Grant Community User Guide is a comprehensive reference document that provides technical information about Grants.gov. Proposers can download the User Guide as a Microsoft Word document or as a PDF document. The Grants.gov User Guide is available at: <http://www.grants.gov/CustomerSupport>. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

Submitting the Proposal: Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program where they will be reviewed if they meet NSF proposal preparation requirements. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal.

A. NSF Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board (NSB)-approved merit review criteria: intellectual merit and the broader impacts of the proposed effort. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two NSB-approved merit review criteria are listed below. The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which the reviewer is qualified to make judgments.

What is the intellectual merit of the proposed activity?

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at: <http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf>.

Mentoring activities provided to postdoctoral researchers supported on the project, as described in a one-page supplementary document, will be evaluated under the Broader Impacts criterion.

NSF staff also will give careful consideration to the following in making funding decisions:

Integration of Research and Education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is

committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Additional Review Criteria:

Option 1: Technology Translation Competition

Review of Preliminary Technology Translation Plans:

Preliminary Technology Translation Plans will receive expedited merit review by panels of experts drawn from both the technical and business communities. The goal is to have all reviews completed within three months of the submission deadline. Reviews will be conducted using summary ratings in key rating categories with limited or no narrative explanation. Copies of the rating sheets, with identifying information for the raters removed, will be provided to proposers.

Review Criteria:

- A detailed description of the technology developed, a listing of funding sources, amount, and timing of such funding, and its contribution to the maturation of the proposed technology to its current state.
- A succinct specification of the current state of the technology and the remaining research needed for the successful translation of the subject technology to commercial development.
- A plan for a fully functioning prototype to be available within a year.
- A preliminary market research study to support the commercial potential of the proposed technology development.
- A preliminary patent search and accompanying discussion to support the feasibility of obtaining needed licenses and/or sufficient protection for intellectual property developed.
- Detailed discussion of plans to employ business consulting and advisory services.
- Short bios of the Preliminary Technology Translation team members, highlighting their technical expertise and track records in successful technology and business development.
- A detailed plan for involvement of undergraduate, graduate students and post-docs, incorporating an explanation of how the proposed effort will enhance their knowledge of innovation.
- Budget and budget justification that indicates how and where the requested funds will be spent. Note, if there is minimal research (i.e. most of the work is to generate the final plan), then the total budget should be significantly less than the max of \$300,000.

Review of Final Technology Translation Plans:

The Final Technology Translation Plans will receive expedited review by the NSF. All submitters of Final Technology Translation Plans are required to travel to NSF to present their plan to NSF staff as part of the selection process. NSF will endeavor to inform investigators whether or not their project has been selected within two months of submission of the supplement.

Only the Final Technology Translation Plans selected to receive their supplemental funding will be made available by the awardees to all third-party funders (with appropriate Confidentiality Agreements) who request the opportunity to evaluate them. Copies of these agreements must be submitted to NSF prior to the distribution or availability of the Final Technology Translation Plans to the third-party investors. It is the responsibility of the Final Technology Translation Plan awardees to disclose the appropriate Intellectual Property (IP) protection, including patent disclosures and filings to third-party funders. NSF is neither responsible for the type of agreement reached between the potential grantee and the third-party investor nor the type of intellectual property information released to the third-party investor.

After copies of Confidentiality Agreements have been submitted to NSF, Final Technology Translation Plan awardees will receive their final increment of funding and are expected to attend and participate in a "Technology Showcase" to be held approximately 21 months after the start date of the initial award. At the showcase, each project team will pitch their Technology Translation Plans to potential investors.

Review Criteria:

- The quality of the technical discussion including the results of proof-of-concept and prototype development, evaluation, design issues, development strategy.
- The quality of the legal discussion including the availability, strength and defensibility of background and anticipated Intellectual Property protection, and current status of patent disclosures, filings, licensing opportunities, and environmental health and safety, liability, and regulatory issues.
- The quality of the manufacturing discussion including discussion of potential processes, estimated capital investment required at commercial scale and projected unit costs.
- The quality of the marketing discussion including competitive technologies, product launch plan.
- The quality of the financial discussion including required funds, estimated revenues, capital expenditures, payback period.
- The quality of human resources discussion including key personnel, including short bios.
- The effectiveness of the education impact including report on involvement of undergraduate, graduate students and post-docs, including a discussion of how the effort enhanced their knowledge of innovation.
- The quality of the technology translation plan - Is the final version complete? Comprehensive? Convincing?

Option 2: Research Alliance Competition

Review criteria for the Research Alliance Competition include the following:

- The quality of the strategic plan, milestones, and deliverables.
- The quality and commitment of the partners and stakeholders.
- The commitment of the third party investors and the level of the proposed funding amounts and types (cash and/or in-kind) relative to the work being proposed.
- The overall quality of the management plan including the specifics of participant, partner, and stakeholder roles.
- The effectiveness of the proposed plan to translate research and/or technology.
- The effectiveness of the partnership in catalyzing an innovation ecosystem.
- The effectiveness of the assessment plan.
- The relevance of the proposed metrics to the anticipated results.
- The net added value to students of the proposed work.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on

the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (GC-1); * or Research Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at

http://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period. (Some programs or awards require more frequent project reports). Within 90 days after expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report will delay NSF review and processing of any future funding increments as well as any pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through FastLane, for preparation and submission of annual and final project reports. Such reports provide information on activities and findings, project participants (individual and organizational) publications; and, other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system. Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

Option 2: Research Alliance Competition

In addition, submissions awarded under Option 2 will be required to submit an updated strategic plan as part of their first annual report.

Option 1 and Option 2 Assessment:

OMB/OSTP Memorandum M-09-27 directed science and technology agencies to describe the expected outcomes from their research in relation to these four practical challenges and cross-cutting areas, providing quantitative metrics where possible, and describe how they plan to evaluate the success of various techniques to increase support for high-risk research.

In compliance with this memorandum, each annual and final project report should provide an explanation of the quantitative and qualitative metrics that have been used in evaluating the impact of their activities.

In order to reduce reporting and administrative burden, proposers are encouraged to use administrative records where possible. Universities participating in the OSTP/NIH/NSF/Federal Demonstration Partnership's (FDP) STAR METRICS program (http://sites.nationalacademies.org/PGA/fdp/PGA_057189) are encouraged to contact their institutional representatives to identify ways in which the program could support the evaluation of their activities.

The report should be filed in the activities and findings section of the annual and final reports.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Rathindra DasGupta, Program Director, telephone: (703) 292-8353, email: rdasgupt@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

IX. OTHER INFORMATION

The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, National Science Foundation Update is a free e-mail subscription service designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail when new publications are issued that match their identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the [NSF web site](#).

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this new mechanism. Further information on Grants.gov may be obtained at <http://www.grants.gov>.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Facilitation Awards for Scientists and Engineers with Disabilities provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <http://www.nsf.gov>

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| • Location: | 4201 Wilson Blvd. Arlington, VA 22230 |
| • For General Information
(NSF Information Center): | (703) 292-5111 |
| • TDD (for the hearing-impaired): | (703) 292-5090 |
| • To Order Publications or Forms: | |
| Send an e-mail to: | nsfpubs@nsf.gov |
| or telephone: | (703) 292-7827 |
| • To Locate NSF Employees: | (703) 292-5111 |

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Division of Administrative Services
National Science Foundation
Arlington, VA 22230

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The National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (800) 281-8749

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